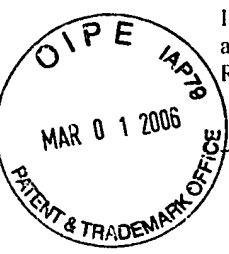


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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service by First Class Mail, in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, by Thomas Lizzi, Registered Representative.



Thomas Lizzi
Thomas Lizzi

Date: February 27, 2006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of: Liu et al.)	Date: February 27, 2006
)	
Serial No.: 10/801,970)	Art Unit: 1742
)	
Filed: March 16, 2004)	Examiner: Ngoclan Thi Mai
)	
For: BLENDED POWDER SOLID- SUPERSOLIDUS LIQUID PHASE SINTERING)	
)	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § § 1.51, 1.56, 1.97, and 1.98, a copy of the art identified on the attached form PTO/SB/08A is enclosed herewith as a citation in connection with the above-captioned application and is incorporated by reference herein. Each item of the art being disclosed herein was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the instant Supplemental Information Disclosure Statement. To wit, the communication was from the Japan Patent Office with reference to Japan patent application number 2004-521407 and was transmitted from the Japan

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Patent Office on December 6, 2005. A check for the fee set forth in 37 CFR § 1.17(p), i.e., \$180, is enclosed herewith.

Each item of the art identified herein is a Japanese-language document. Full English-language translations of each item have been obtained by Applicants and are enclosed herewith as are the English-language abstracts that were provided to Applicants by the Japan Patent Office. The items of art are as follows:

- (1) Japan Laid-Open Patent Publication No. H05[1993]-009509;
- (2) Japan Laid-Open Patent Publication No. S63[1988]-293102;
- (3) Japan Laid-Open Patent Publication No. 2000-199001;
- (4) Japan Laid-Open Patent Publication No. 2000-336403; and
- (5) Japan Laid-Open Patent Publication No. 2001-131677.

In the following concise explanations about the relevance of each of above identified items, in accordance with 37 CFR § 1.98(a)(3)(1), the items are identified by the item numbers given above.

Item 1 deals with the problem of how to improve the density of a sintered tool steel body. *See*, Item 1 at paragraphs 0004-0005. However, it contains no teachings with regard to supersolidus liquid phase sintering and in fact teaches away from the use of liquid phase sintering in general since part of its solution is to use solid phase sintering. *Id.* at paragraphs 0005-0006. Item 1 teaches two embodiments. In the first, the finer and coarser powders have the same alloy composition, and separate experiments are done with each of six different alloys H1-H6. *Id.* at paragraphs 0008-0011. In the second embodiment, powders of the various elements comprising alloy H4 are mixed together. Neither of these embodiments meets all of the limitations of claim 1. Embodiment 1

mixes together finer and coarser powders of the same alloy. Embodiment 2 mixes together elemental powders, i.e. powders which are not prealloyed powders. Moreover, a person skilled in the art would know that elemental powders are not amenable to supersolidus liquid phase sintering because they have no two phase region in which supersolidus liquid phase sintering can occur. Furthermore, there is nothing in Item 1 that suggests modifying its teachings to obtain the invention claimed in the instant application.

Item 2 deals with the problem of obtaining a sintered iron-based alloy article having improved strength and toughness. Item 2 at paragraph 0003. Its solution is to combine finer and coarser fractions of the same alloy in certain ratios. *Id.* at paragraph 0004. Thus, Item 2 does not teach the use of finer and coarser powders of different types as required by the claims of the instant application. Moreover, like Item 1, Item 2 contains no teachings about supersolidus liquid phase sintering. Furthermore, there is nothing in Item 2 that suggests modifying its teachings to obtain the invention claimed in the instant application.

Item 3 addresses the problem of providing a powder and method for manufacturing sintered parts that have a sintered density of 93% or higher. Item 3 at paragraph 0007. Its solution is to mix a coarser powder with agglomerated finer powder wherein the average granule size of the agglomerates is substantially the same as that of coarser powder. *Id.* at paragraph 0009. The finer and coarser powders are the same type of powder as is clear from the embodiments. *See, id.* at paragraphs 0016-0032. Thus, Item 3 does not teach the use of finer and coarser powders of different types as required by the claims of the instant application. Furthermore, the two alloys that are used in the

embodiments, i.e., 316L and 410L, are alloys which those skilled in the art know are not amenable to supersolidus liquid phase sintering because they have no substantial two phase region in which supersolidus liquid phase sintering can be done. Thus, Item 3 does not anticipate any of the claims of the instant application. Furthermore, there is nothing in Item 3 that suggests modifying its teachings to obtain the invention claimed in the instant application.

Item 4 teaches about producing three dimensional shapes in a layerwise fashion using a laser to consolidate each powder layer atop the previous layer. *See*, Item 4 at paragraph 0008. Item 4 teaches several methods of how to do this. The section that is most relevant is the section titled “Simultaneous Melting of Powders Having Different Melting Points.” In this section, Item 4 describes a method which employs bronze, i.e., a prealloyed coarser powder that is amenable to supersolidus liquid phase sintering in combination with a finer powder that is either iron or nickel, i.e., a finer powder that may be essentially solid at the highest temperature that a green article made of bronze and the finer powder may be supersolidus liquid phase sintered without slumping. *Id.* at paragraph 0059. However, Item 4 clearly teaches that the finer and courser powders are completely melted by the laser beam and alloyed together. *Id.* at paragraph 0059; *see also*, paragraphs 0056-0058 and FIG. 14. Since the powder is completely melted, this method of Item 4 does not result in a green article comprising a powder mixture of a relatively finer and a relatively coarser powder as required by the claims of the instant application. Therefore, Item 4 does not anticipate any of the claims of the instant application. Furthermore, there is nothing in Item 4 that suggests modifying its teachings to obtain the invention claimed in the instant application.

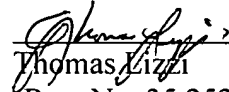
Item 5 teaches about mixing various elemental powders of different sizes and then sintering them to create a sintered compact. Item 5 at paragraph 0007. Thus, Item 5 does not teach the use of a relatively coarser prealloyed powder as required by the claims of the instant application. Nor does it teach the use of powders which are amenable to supersolidus liquid phase sintering. Further, Item 5 teaches using mixtures comprising three powder size fractions, a coarser powder, a finer powder, and an intermediate size powder. *Id.* at paragraph 0008. Thus, Item 5 does not satisfy the claim limitations that the coarser and finer powders make up all of the powder in the green article, i.e., that they be complementary. Therefore, Item 5 does not anticipate any of the claims of the instant application. Furthermore, there is nothing in Item 5 that suggests modifying its teachings to obtain the invention claimed in the instant application.

Additionally, there is nothing in the items taken together or singly that would render obvious any of the claims of the instant application.

Applicants hereby request the Examiner to review and make an independent evaluation of the art. No significance is meant to be attached to any markings that may be found on the enclosed referenced documents. The referenced documents are not necessarily analogous art. Applicants hereby respectfully request that an initialed copy of the PTO/SB/08A be returned to the undersigned.

Applicants believe that their BLENDED POWDER SOLID-SUPERSOLIDUS LIQUID PHASE SINTERING invention as described and claimed in the instant application is neither taught nor suggested by the disclosed art. Accordingly, Applicants believe the invention is to be patentable over this art and respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Thomas Lizzi", is written over a horizontal line.

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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Substitute for form 1497-0

(Use as many sheets as necessary)

Sheet 1

of	1
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Complete if Known

Application Number	10/801,970
Filing Date	March 16, 2004
First Named Inventor	Liu
Art Unit	1742
Examiner Name	Ngoclan Thi Mai
Attorney Docket Number	2089-001 D1

U. S. PATENT DOCUMENTS

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.